

BOGDANOV, Petr Lukich; DANILOV, M.D., prof., retsenezent; PREOBRAZHENSKIY,
A.V., red.; FUKS, Ye.A., red. izd-va; PARAKHINA, N.L., tekhn.
red.

[Botany] Botanika. 2., perer. izd. Moskva, Goslesbumizdat,
1961. 391 p. (MIRA 15:2)

1. Povolzhskiy lesotekhnicheskii institut im. M.Gor'kogo (for
Danilov).

(Botany)

PREOBRAZHENSKIY, A.V.

Effect of care and the method of planting on the growth
of artificially established pine plantations. Nauch. trudy.
LTA no.99:71-78 '62. (MIRA 17:1)

PREOBRAZHENSKIY, A. V.

Coniferae

Density of conifer seedlings on freshly cleared land. Les. khoz. 5, no. 7, 1952.

9. Monthly List of Russian Accessions, Library of Congress, September ¹⁹⁵²~~1953~~. Unclassified.

PREOBRAZHENSKIY, A. V.

- 534 Zakladka drevesnykh pitomnikov i Vyrashchivaniye posadochnogo materiala. Posobiye po kursovomu proyektirovaniyu. (Dlya studentov lesokhoz. Fak.) izd 2-e, pererabot. L., 1954. 84s 20sm. (M-vo Vyssh. obrazovaniya SSSR. Vsesoyuz. Zauch. Lesotekan. in-t). 800 ekz. Baspl. - (54-55324)
1 -e izd Vyshlo pod zagl: Posobiye po Kursovomu proektirovaniyu zakladki drevesnykh pitomnikov i Vyrashchivaniyu posadochnogo materiala. 634.956.4 (071.4)

SO: Knizhnaya Letopis, Vol 1, 1955

L 31075-65 ENT(m)/EPF(c)/ENP(j)/EWA(c) PC-4/Pt-4 RM

ACCESSION NP: AP5006072

S/0204/65/003/001/0003/0000

AUTHOR: Liberman, A.L.; Lerman, B.M.; Preobrazhenskiy, A. V.

TITLE: Use of thiourea adducts for separation of certain dialkylcyclohexanes into stereoisomers

SOURCE: Neftekhimiya v. 5, no. 1, 1965, 3-9

TOPIC TAGS: thiourea, cycloalkane, cyclohexane, stereoisomer, separation

ABSTRACT: A new method has been developed for separating mixtures of stereoisomers of 1-alkyl-4-tert-alkylcyclohexanes. This method is based on the fractional precipitation and fractional decomposition of their adducts with thiourea. It was used to separate cis- and trans-isomers of 1-ethyl-4-tert-butyl and 1-ethyl-4-tert-pentylcyclohexane. The physical constants of the isomers were then determined. It is noted that conventional physical separation methods were ineffective. [SM]
Orig. art. has: 2 tables and 3 figures.

Card 1/2

L 31075-65

ACCESSION NR: AP5006072

ASSOCIATION: Institut organicheskoy khimii im. N.D. Zelinskogo
AN SSSR (Institute of Organic Chemistry, AN SSSR)

SUBMITTED: 01Aug64

ENCL: 00

SUB CODE: 00,GC

NO REF SOV: 004

OTHER: 006

ATD PRESS: 3198

Card 2/2

PREOBRAZHENSKIY, A.Ya.; STEPANOV, V.A.

Chemical saw and drill. Prib. i tekhn. eksp. 8 no.4:192-193
Jl-Ag '63. (MIRA 16:12)

1. Institut vysokikh davleniy AN SSSR.

84659

1.12.10 only 2108
5.1600 only 1273,1043

S/020/60/135/001/011/030
B006/B056

AUTHORS: Vereshchagin, L. F., Corresponding Member of the AS USSR,
Ryabinin, Yu. N., Preobrazhenskiy, A. Ya., and Stepanov,
V. A.

TITLE: Growth of Metal ²¹Monocrystals Under High Hydrostatic Pres-
sure ²¹

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 1,
pp. 45-47

TEXT: The growth of metal monocrystals at high pressures is of interest
above all because, on the basis of thermodynamic considerations, it must
be assumed that the higher the pressure, the lower will be the inclination
for forming structural defects. The assumption based on theory that with
pressure the regularity of the lattice increases, requires experimental
verification, which was the aim of the authors of the present paper. In
this, the authors directed their attention also upon the fact that by
the action of pressure, the properties of the crystals may undergo an
essential change. Al and Zn monocrystals were grown from a melt. The melt

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Growth of Metal Monocrystals Under High
Hydrostatic Pressure

S/020/60/135/001/011/030
B006/B056

was in a conical graphite container, which was especially well suited, because in it (in the furnace) a temperature gradient of 7 - 10 deg/mm could be well produced. Cooling of the melt was effected by lowering the electric power applied to the furnace. This was arranged in such a manner that the front of the crystallization temperature moved with 0.5 - 0.7 mm/min (at 10,000 atm), by which the rate of crystal growth was determined. First, monocrystals were grown in a vacuum and nitrogen- and argon media (normal pressure), the method being studied and the operation of the furnace watched. These crystals were produced at 0.3 kw (Zn) and 0.8 kw (Al) respectively during a time of 100 and 150 min, respectively. It was found that the electric power used had to be increased approximately linearly with pressure and amounts to 10,000 atm (N₂ or Ar) 1.8 and 3.0 kw, respectively. Under these conditions, the time² of growth of a Zn monocrystal is 280 min, and for Al monocrystal 480 min. The experiments were carried out under constant and also not, variable pressure. The authors assume that the crystals grown under variable pressure contain less gas than those grown under constant pressure. Growing under constant pressure required a special compensation of the temperature-dependent pressure change; the deviations from the constant pressure value were about +50 atm.

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Growth of Metal Monocrystals Under High
Hydrostatic Pressure

S/020/60/135/001/011/030
B006/B056

The crystal structure was subjected to X-ray examination; the results obtained by these examinations are intended to be published in a later paper. There are 2 figures and 20 references: 12 Soviet, 2 German, 4 US, and 2 British.

ASSOCIATION: Institut fiziki vysokikh davleniy Akademii nauk SSSR
(Institute of Physics of High Pressures of the Academy
of Sciences USSR)

SUBMITTED: July 7, 1960

X

Card 3/3

18.9500
1.6000 also 3409

27721
S/120/61/000/003/035/041
E073/E335

AUTHORS: Preobrazhenskiy, A.Ya. and Stepanov, V.A.

TITLE: Graphite Crucible-furnace for Growing Single Crystals

PERIODICAL: Pribery i tekhnika eksperimenta, 1961, No. 3, pp. 187 - 188

TEXT: From the point of view of production of crystals with properties approaching those predicted by the solid-state theory, it is interesting to investigate the influence of high hydrostatic pressure on the growth and properties of single crystals. A description is given of a furnace for growing single crystals, which was tested at normal pressure and in vacuum and is intended for placing into a high-pressure vessel. A sketch of the furnace is shown in Fig. 1 (1 - contact ring made of Steel 3; 2 - contact ring made of graphite; 3 - contact lead made of copper; 4, 5 - screw and washer made of Steel 3; 6 - screen made of graphite; 7 - heating element made of graphite; 8 - bushing made of pyrophilite). The heating element is machined from a solid graphite block

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Graphite Crucible-furnace

27721
S/120/61/000/003/035/041
E073/E355

to a configuration as shown in Fig. 2, which ensures the required temperature gradient of the furnace during operation. The central conical part of the body of the heating element is the hot part and serves as the ingot mould for producing the single crystals. By changing the dimensions of the middle part of the heating element, it is possible to change the distribution of the electric resistance and the temperature of the furnace, thus obtaining the required temperature distribution in the furnace. The massive head of the heater is slotted to receive electrical contacts. The power supply to the furnace is varied between the limits of 0.3 to 1.5 kW to ensure the temperature conditions required for growing single crystals. The power input can be increased to 3 to 4 kW without changing the dimensions of the furnace. A coaxial graphite screen resting on a pyrophillite insulating bushing, located at the base of the heating element, is used for thermal insulation of the furnace. The screen is fixed at the top by means of a graphite nut, which is screwed on to the top of the heating element. The space between the heating element and the graphite screen is filled with magnesium oxide, which serves as thermal and

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Graphite Crucible-furnace

²⁷⁷²¹
S/120/61/000/003/035/041
E073/E335

electrical insulation. Due to the conical shape of the heating element the thickness of the MgO layer is variable and averages 2.5 mm. Due to this thermal insulation the temperature of the external wall of the screen does not exceed 250 °C, even at the hottest section of the furnace (point B). The furnace is simple to produce and reliable in operation. The same graphite mould can be used for repeated growing of single crystals. The first sign of damage to the internal walls of the mould is the appearance of black stripes on the surfaces of the specimens. The internal wall of the mould must be carefully rubbed (smoothed) to eliminate damage. During the experiments the furnace is placed₂ under the bell of a vacuum system, where a vacuum of about 10⁻² mm Hg is produced or inert gas (Ar or N₂) is fed in. The temperature difference between the coldest (A) and the hottest (B) points of the mould exceeds 300 °C before crystallisation starts. Cooling of the melt in the ingot mould is achieved by reducing the electric current fed to the mould. The furnace has been used for growing crystals of Zn, Al and Cu and a yield of single

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27721

Graphite Crucible-furnace

S/120/61/000/003/035/041
E073/E335

crystals of up to 90% can be obtained. Acknowledgments are expressed to L.F. Vereshchagin for his advice and interest and to I.Ye. Surkov and V.A. Frolov for their assistance in producing the furnace described here.

There are 2 figures and 5 Soviet references.

ASSOCIATION: Institut fiziki vysokikh davleniy AN SSSR
(Institute of High-pressure Physics of the
AS USSR)

SUBMITTED: July 9, 1960

Card 4/5

L 56651-65 EWT(1)/EWT(m)/EWG(v)/EWA(d)/EPR/T-2/EWP(t)/EWP(k)/1PA(bb)-2/
EWP(b)/EWA(c) Pe-5/Pf-4/Pe-4 JD/WW/HV

ACCESSION NR: AP5011898

UR/0120/65/000/002/0199/0199
539.893

AUTHOR: Preobrazhenskiy, A. Ya.; Stepanov, V. A. 38

TITLE: Valve for 20-katm pressure gas 3

SOURCE: Pribory i tekhnika eksperimenta, no. 2, 1965, 199

TOPIC TAGS: high pressure valve 13

ABSTRACT: An improved design (sketch supplied) of an old Soviet 6-katm needle valve which now withstands a working pressure of 10 katm and a closed-position needle pressure of 20 katm is briefly described. A hydraulic actuator (oil at 1.5-katm pressure) operates the needle. It is hoped that the improved valve would operate at pressures as high as 12-13 katm. Orig. art. has: 1 figure.

ASSOCIATION: Institut fiziki vysokikh davleniy AN SSSR (Institute of High-Pressure Physics, AN SSSR)

SUBMITTED: 19Feb64

ENCL: 00

SUB CODE: IE

NO REF SOV: 001

OTHER: 001

282
Card 1/1

L 56650-65 EWG(j)/EWT(1)/EWP(e)/EWT(m)/EPF(c)/EWP(i)/EWA(d)/EPR/T/EWP(t)/
 EEC(b)-2/EWP(k)/EWP(b)/EWA(c) Pf-L/Pr-L/Fs-L/Pi-L LJP(c) JD/WH/HW/GG/WH
 UR/0120/65/000/002/0196/0198 59
 539.893:548.55 58
 0

ACCESSION NR: AP5011897

AUTHOR: Freobrazhenskiy, A. Ya.; Stepanov, V. A.

TITLE: Crystal growing in high-pressure gas

SOURCE: Pribory i tekhnika eksperimenta, no. 2, 1965, 196-198

TOPIC TAGS: crystal, crystal growing

ABSTRACT: An outfit for crystal growing at high pressures was developed for studying the effect of pressure on crystal lattice. Single crystals of Zn, Al, Cu were grown at 10 katm. The outfit can also be used for growing CdS, ZnS, PbS, and other crystals having high vapor pressure at melt temperature. Argon or nitrogen, via a filter, is fed to a compressor and then, via another filter, to a high-pressure chamber (design sketch supplied) 30 mm diameter, 140 mm height, which includes a special graphite-heater electric furnace. Some details are given, and processing is described. "The authors wish to thank L. F. Vereshchagin for his valuable advice and interest in the work." Orig. art. has: 3 figures.

Card 1/2

L 56650-65

ACCESSION NR: AP5011897

ASSOCIATION: Institut fiziki vysokikh davleniy AN SSSR (Institute of High-
Pressure Physics, AN SSSR)

SUBMITTED: 19Feb64

ENCL: 00

SUB CODE: SS

NO REF SOV: 006

OTHER: 001

282
Card 2/2

ACC NR: AP6030162

AUTHOR: Preobrazhenskiy, A. Ya.; Stepanov, V. A.

SOURCE CODE: UR/0120/66/000/004/0217/0218

ORG: Institute of Physics of High Pressures, AN SSSR, Moscow (Institut fiziki vysokikh davleniy AN SSSR)

TITLE: Combined lead of large cross section for feeding electrical energy and gases into high pressure vessels

SOURCE: Pribery i tekhnika eksperimenta, no. 4, 1966, 217-218

TOPIC TAGS: high pressure chamber, high temperature instrument, electric power transmission

ABSTRACT: Two engineering drawings for combined leads used to feed electrical energy and gases into high pressure vessels are presented and discussed. The leads have a large cross section (approximately 500 mm²) and were tested at a pressure of approximately 15 kilobar and a temperature of approximately 2500°C inside the high pressure vessel. The combined lead incorporates a thermocouple and is insulated from the high pressure vessel case by means of pyrophyllite packing, by a thin layer of Fe₂O₃ paste applied to the threaded connection and by an additional conic packing. Up to 8 independent wire leads can be used. An insulated nut is used to produce the initial pressure in the packing. Cooling liquid may be used in the lead to program the pro-

UDC: 539.89

Card 1/2

ACC NR: AP6030162

per growth of crystals inside the high pressure vessel and to maintain a constant lead temperature as the density of the electrical current passing through the lead is varied. Other combinations of the basic elements described in the article have been used experimentally for a variety of applications. Orig. art. has: 2 figures.

SUB CODE: 20,14,09/ SUBM DATE: 05Aug65/ ORIG REF: 009/ OTH REF: 005

Card 2/2

KLINOV, I.Ya.; LEVIN, A.N. Prinimali uchastiye: MOLOKANOV, A.V.;
VASHIN, G.Z.; OLENEV, B.A., inzh., retsenzent;
PREOBRAZHENSKIY, A.Yu., red.; RYZHOVA, L.P., inzh., red.
izd-va; DEMKINA, N.F., tekhn. red.; GORDEYEVA, L.P.,
tekhn. red.

[Plastics in the manufacture of chemical machinery] Plast-
massy v khimicheskoy mashinostroyeni. Moskva, Mashgiz,
1963. 214 p. (MIRA 17:1)

ABRAMOV, L.M., inzh.; ZHURAVSKIY, L.M., inzh.; ZAVGORODNYI, V.K.,
inzh., retsenzent; PREOBRAZHENSKIY, A.Yu., red.; EL'KIND,
V.D., tekhn. red.

[Use of plastics in the manufacture of textile machinery]
Primenenie plastmass v tekstil'nom mashinostroenii; iz
opyta proizvodstva priadil'nogo oborudovaniia. Moskva,
Mashgiz, 1963. 113 p. (MIRA 16:11)
(Spinning machinery) (Plastics)

TOMASHOV, N.D.; AL'TOVSKIY, R.M.; KOLOTYRKIN, Ya.M., doktor khim.
nauk, ~~rets~~senzents; PREOBRAZHENSKIY, A.Yu., red.;
YEVSTAF'YEVA, N.P., red. izd-va; SMIRNOVA, G.V., tekhn.red.

[Titanium corrosion and its protection] Korroziia i zashchita
titana. Moskva, Mashgiz, 1963. 167 p. (MIRA 16:7)
(Titanium--Corrosion)

FREZINSKIY, L.L.; PREOBRAZHENSKIY, A.Yu., red.; KRASHENINNIKOVA,
V.F., tekhn. red.

[For increasing the productivity of labor; from the work
practice of the best section of the chassis workshop of
the Stalingrad Tractor Plant] Za povyshenie proizvoditel'
nosti truda; iz opyta raboty luchshego uchastka tsekha
shassi STZ. Stalingrad, Stalingradskoe knizhnoe izd-vo,
1953. 63 p. (MIRA 15:7)

(Vlgograd--Tractor industry)

BALAKIROV, S.A.; PREOBRAZHENSKIY, A.Yu., red.; FRASHENINNIKOVA, V.F.,
tekhn. red.

[Promoting technological development in stalingrad industry]
Bor'ba za tekhnicheskii progress v promyshlennosti Stalingrada.
Stalingrad, Stalingradskoe knizhnoe izd-vo, 1953. 125 p.
(MIRA 15:7)

(Volgograd---Technological innovations)

PRONIN, Yuriy; ~~PREOBRAZHENSKIY~~, A.Yu., redaktor; KRASHENINNIKOVA, V.F.,
tekhnicheskij redaktor

[Hydraulic construction worker's diary] Dnevnik gidrostroevtsa.
Stalingrad, Oblastnoe kn-vo, 1952. 50 p. (MLRA 9:12)
[Microfilm]
(Transportation, Automotive)

SLEPUKHA, D.: PREOBRAZHENSKIY, A. Yu., redaktor; KRASHENINNIKOVA, V.F.
tekhnicheskii redaktor.

[Our work on the "Uralets" excavator] Nasha rabota na ekskavatore
"Uralets." Stalingrad, Oblastnoe knigoizdatel'stvo, 1952. 15 p.
(Excavating machinery) (MLRA 8:8)

PHASE I BOOK EXPLOITATION SOV/5567

Preobrazhenskiy, Aleksey Yuvenaliyevich

Tayny vozdushnogo okeana (Secrets of the Air Ocean) Moscow, Izd-vo "Znaniye", 1961. 36 p. (Series: Vsesoyuznoye obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy. Seriya IV, 1961: Tekhnika, no. 8) 48,000 copies printed.

Scientific Ed.: V. V. Dobronravov, Doctor of Physics and Mathematics, Professor; Ed.: T. F. Islankina; Tech. Ed.: A. S. Nazarova.

PURPOSE: This booklet is intended for general readers interested in space flight.

COVERAGE: The booklet presents in popular form problems dealing with the energy reserves in the upper layers of the atmosphere and describes designs of aviation motors and aircraft capable of utilizing this form of energy. A table at the end of the booklet lists all Soviet satellites, cosmic rockets, and spaceships launched up to May 1961, including brief data on Gagarin's space flight. No personalities are mentioned. A list of recommended literature on the subject is appended.

Card ~~1/2~~

SHAFRANOV, K.I.; PREOBRAZHENSKIY, A.Yu, redaktor; KRASHENINNIKOV, K.F.
tekhnicheskii redaktor.

[Our work with the EM-301-5 multi-bucket excavator] Nasha rabota
na mnogokogshovom ekskavatore EM-301-5. Stalingrad, Oblastnoe
knigoizdatel'stvo, 1952. 19 p. (MLRA 8:8)
(Excavating machinery)

BELOUSOV, A.P.; PRMOBRAZHENSKIY, A.Yu., redaktor; KRASHENINNIKOVA, V.F.
tekhnicheskii redaktor.

[Work of an automatic concrete plant] Rabota avtomatizirovannogo
betonnogo zavoda. Stalingrad, Oblastnoe knigoizdatel'stvo, 1952.
21 p. (MLRA 8:9)

(Concrete)

KUKLIN, P.V.; PREOBRAZHENSKIY, A.Yu., redaktor; KRASHENINNIKOVA, V.F.,
tekhnicheskiiy redaktor.

[Leading machinery operators of the Volga-Don project] Peredovye
mekhanizatory Volgodonstroia. Stalingrad, Oblastnoe knigoizd-vo,
1952. 111 p. [Microfilm] (MLBA 7:10)
(Volga-Don Canal) (Building)

PREOBRAZHENSKIY, A.Yu., redaktor; KRASHENINNIKOVA, V.F., tekhnicheskii
redaktor.

[Taking the offensive] V nastuplenii. [Stalingrad] Stalingradscoe
knizhnoe izd-vo, 1953. 63 p. [Microfilm] (MLRA 7:11)
(Stalingrad--Hydroelectric power stations)

PREOBRAZHENSKIY, A.Yu, redaktor; KRASHENINNIKOVA, V.F., tekhnicheskii
redaktor.

[According to the Kolesov method; from experience in introducing
the power method of cutting metals in the Stalingrad Tractor
Plant and the Stalingrad Copper Works.] Po metodu kolesova; iz
opyta vnedrenia silovogo metoda rezaniia metallov na Stalin-
gradskom traktornom zavode i Stalingradskom zavode medoborudovaniia.
[Stalingrad] Stalingradskoe knizhnoe izd-vo, 1954. 70 p. (MLRA 86)
(Metal cutting)

PREOBRAZHENSKIY, B., khudozhnik

Across Guinea and Mali. Znan.--sila 38 no.6:30-33 Je '63.
(MIRA 16:8)

(Guinea---Description and travel)
(Mali---Description and travel)

PREOBRAZHENSKIY, B., zootekhnik

Feeding fish scraps to deer. Nauka ipered.op.v sel'khoz. 9
no.1:74 Ja '59. (MIRA 15:3)
(Deer--Feeding and feeds)

PREOBRAZHENSKIY, B., prof., zasluzhennyi deyatel' nauki

Lower the number of angina cases. Okhr.truda i sots.strakh.
no.2:58-60 Fe '59. (MIRA 12:4)

1. Deystvitel'nyy chlen AMN SSSR.
(THROAT--DISEASES) (MEDICINE, PREVENTIVE)

PIEDRAZHU, M. E.

Corresponding Member, USSR Academy of Medical Sciences

"A Militant Pseudo-Innovator and his Henchmen"

Current Digest of the Soviet Press, Vol. 1 No. 9, 1949, page 55. (in CIA Library).

Category : USSR/Radiophysics - Application of radiophysical methods

I-12

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 2053

Author : Breytbart, A.Ya., Lyudmirskiy, I.L., Preobrazhenskiy, B.I.

Title : Investigation of Radio-Broadcast Interference produced by Television Sets

Orig Pub : Tekhnika televideniya (M-vo radiotekhn. prom-sti SSSR), 1954, No 1, 3-67

Abstract : It is established from preliminary measurements that the interference in the antenna of a broadcast receiver is produced principally by electric induction, and that the principal sources of noise are the horizontal sweep system and the output circuit of the video amplifier. The mechanism by which the interference acts on the input of the broadcast receiver is explained. The theoretical analysis is used to establish that to calculate the noise-signal level at the receiver input it is necessary to know the coupling capacitance between the interfering element of the television set and the antenna of the receiver. A simple equation, suitable for engineering computation, is derived to determine this capacity. The so-called primary and secondary interference sources are studied. Primary sources are the horizontal transformer, the horizontal-sweep generator tubes, the deflecting system, the wiring, the output circuit of the video amplifier, and the screen of the tube. Secondary sources are the graphite coating of the tube, the vertical sweep generator, and the supply line. A table is given for the noise level and for the coefficients of

Card : 1/2

Category : USSR/Radiophysics - Application of radiophysical methods

I-12

Abs Jour : Ref Zhur - Fizika, No 1, 1957 No 2053

harmonics from various elements of the KVN-40 television set. Recommendations are made concerning noise suppression, involving the shielding of the primary and secondary noise sources, isolation of the secondary sources with filters, and using a balanced circuit for the connection of the deflecting horizontal coil. Comparative noise measurements are made with shielded and unshielded KVN-49, and T-2 "Leningrad" television sets. The noise level is reduced up to 60 db by using the shielding measures.

Card : 2/2

FD-2294

PREOBRAZHENSKIY, B. I.
USSR/Electronics - Television

Card 1/1 Pub 90-7/12

Author : Breytbart, A. Ya., Lyudmirskiy, I. L., and Preobrazhenskiy, B. I.,
Active Members of VNORIE

Title : Sources of Noise in Television Sets and Shielding Devices for Them

Periodical : Radiotekhnika 10, 61-69, Jan 1955

Abstract : Article examines the sources of noise in television sets, listing and discussing them, studies the mechanism of the action of this noise on radio broadcast receivers, and proposes effective methods to eliminate them, including shielding, protection with filters, and a compensation circuit. Diagrams, graphs.

Institution: All-Union Scientific and Technical Society of Radio Engineering and Electric Communications imeni A. S. Popov (VNORIE)

Submitted : July 7, 1953

PREOBRAZHENSKIY, B.K.

9
1/2 ML

✓ 4106 AEC-tr-2435 (Pt. 2) (p. 101-10)
SPALLATION AND FISSION REACTIONS OF COMPLEX
NUCLEI (Cu, Ln, Bi). A. N. Murin, B. K. Preobrazhensky,
[Preobrazhenskiy], I. A. Yulandov, and M. A. Yakimov.
p. 101-10 of CONFERENCE OF THE ACADEMY OF
SCIENCES OF THE USSR ON THE PEACEFUL USES OF
ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE
DIVISION OF CHEMICAL SCIENCE. (Translation). 10p.
This paper was originally abstracted from the Russian
and appeared in Nuclear Science Abstracts as NSA 947939.

PREO BRAZHENSKIY, B.K.

3. PMO

Radiochemical studies of the spallation and fission products from the bombardment of bismuth by 600-m.e.v. protons. A. N. Miron, B. K. Brazhen'skiy, and N. E. Titov. Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk 1955, No. 4, 577-85. —The bombardment of Bi by 600-m.e.v. protons was studied. Isolated and identified were: Po^{214} , Po^{215} , Bi^{214} , Bi^{215} , Pb^{214} , Pb^{215} , Tl^{214} , Tl^{215} , Hg^{214} , Au^{214} , Au^{215} , Ir^{214} , Ir^{215} , Pt^{214} , Os^{214} , W^{214} , Ce^{144} , Ba^{144} , Ag^{110} , Mo^{99} , Sr^{90} , Cu^{64} , P^{32} . The yields of these isotopes show that the ratio of the fission cross section to the spallation cross section is about 0.07, with Sr^{90} and Tl^{215} as the respective fission and spallation products of the highest yield. A comparison of these yields with those obtained with lower-energy protons shows that an increase of the proton energy results in the increase of the asymmetry of the fission yield. Paul V. Feng

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Handwritten signature/initials.

Category: USSR / Physical Chemistry - Surface phenomena. Adsorption.
Chromatography. Ion exchange.

B-13

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 30215

Author : Fredbrazhenskiy B. K., Lilova C. M., Dobronravova A. N., Teterin Ye.
D.

Inst : not given

Title : Ion-Exchange Separation of Active Rare-Earth Elements Without the Use
of a pH-Meter

Orig Pub: Zh. neorgan. khimii, 1956, 1, No 10, 2294-2299

Abstract: Description of a method of chromatographic separation of tracer amounts of rare earths (RE) in columns containing a cationite of the Dowex-50 type, with elution with NH_4 -lactate solutions. A procedure is recommended for the preparation of the elution solution by neutralization (to bromocresol purple with a transition interval pH 5-6) with gaseous NH_3 . It was found that a solution prepared in this manner provides the best conditions for separation of RE, and on addition of phenol (to a concentration of 0.01 M) undergoes no change on prolonged storage. For isolation of Lu - Yb fraction use is made

Card : 1/2

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PREOBRAZHENSKIY, S. N.

6094 KINETICS OF INFRARED LUMINESCENCE OF (UPROSE
OXIDE) EXPERIMENT

It is known that the infrared luminescence of (UPROSE
oxide) is a process of relaxation of the excited state of the
molecule. The kinetics of the relaxation of the excited state of
the molecule is of interest for the study of the mechanism of
the relaxation process. The kinetics of the relaxation of the
excited state of the molecule is studied by the method of
infrared luminescence. The kinetics of the relaxation of the
excited state of the molecule is studied by the method of
infrared luminescence.

L. HOFER

PREOBRAZHENSKIY, B.K.

"Yield of Rare Earth Isotopes in Pu^{239} Fission by Reactor Neutrons," by L. M. Krizhanskiy, Ya. Malyy, A.N. Murin, and B.K. Preobrazhenskiy, Atomnaya Energiya, Vol 2, No 3, Mar 57, pp 276-277

The relative yields of cerium, neodymium, samarium, and cesium in Pu^{239} fusion was determined by direct mass spectrometer analysis.

Graphs and tables of the results are given.

Results are compared with those of Fleming and Thode (Can J Chem 34, 193, 1956) and Wiles, Petruska, and Tomlinson (Can J Chem 34, 227, 1956). Differences in the data are discussed.

It is claimed that data confirm A. C. Pappus' theory concerning the existence of a fine line structure over the mass range 135-137 in Pu^{239} fission by thermal neutrons. (U)

Sum. 1360

PREOBRAZHENSKIY, B.K.

Ion-exchange separation of radioactive rare earth elements. B. K. Preobrazhenskii, A. V. Kalvomin, and O. M. Litovs. *Zhur. Neorg. Khim.* 2, 1104-6 (1957); cf. *C.A.* 51, 7891c. — The rapid sepn. of rare earth elements with a cationic KU-2 resin column of small dimensions is described. With this resin equil. is established more rapidly than with Dowex-50-X12. Lu and Yb can be sepd. in 6 min., and an improved sepn. of Y and Dy is obtained. The form of the resin particles has little effect on the sepn.

J. Rovtar Leach

5
1-4E3d
1-4E4g

111
172 NS

Preobrazensky, B.K.
CZECHOSLOVAKIA/Nuclear Physics - Nuclear Reaction

C-5

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 503

Author : Krizansky, L.M., Maly, J., Murin, A.N., ^hPreobrazensky, B.K.

Inst : -

Title : Yield of Rare Earth Isotopes Upon Fission of Pu^{239} by
Reactor Neutrons.

Orig Pub : Jaderna energie, 1957, 3, No 5, 139-140

Abstract : Translation from the Russian; see Referat Zhur Fizika,
1957, No 10, 24882.

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PREOBRAZHENSKIY, B.K.

48-7-4/21

AUTHORS: Gromov, K.Ya., Dzhelepov, B.S., Preobrazhenskiy, B.K.

TITLE: The Spectra of Conversion Electrons of the Neutron Deficient Thulium Isotopes (Spektry konversionnykh elektronov neytrono-defitsitnykh izotopov tuliya)

PERIODICAL: Izvestiya Akad. Nauk SSSR, Ser. Fiz., 1957, Vol. 21, Nr 7, pp. 918 - 939 (USSR)

ABSTRACT: After irradiation of the tantalum target with rapid protons the rare-earth elements were, by chemical process, separated from it and thereafter, chromatographically, the thulium fractions. The spectrum of the conversion electrons was investigated by means of a "ketron", which process is described in detail. As a result four lines were discovered which are represented on figure 1 and the values are given in table 2. Table 1 shows the values of the Siborg (Seaborg?) tables on neutron deficient thulium isotopes. Figure 2 gives the conversion lines b, c and d of Tu^{168} and table 3 gives the relative intensities of the conversion transtion lines $h\nu = 79.8$ keV. Figure 3 records the possible scheme of the decay of Tu^{168} . Figure 5 shows the curves of the D group of the conversion electrons of Tu^{167} and table 4

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The Spectra of Conversion Electrons of the Neutron Deficient Thulium Isotopes

gives the test results with them; table 5 gives the comparison of the test value K/L with the theoretical one in the case of $Z = 68$ and $h\nu = 207,5$ keV. A comparison was carried out of the test and the theoretical values of the half-decay period with regard to the γ -transition 207 keV (table 6). Table 7 and figure 6 record the same curves and values for group C. Table 8 shows the theoretical interactions $L_I : L_{II} : L_{III} : \gamma$ at various characteristics of the level 264,2 keV and table 9 records the calculated and the experimental data for determining the characteristic of the level 264,2 keV of Er^{167} . The possible scheme of the decay of Tu^{167} is represented by figure 7. Figure 8 and table 11 show the curves and the experimental data of the conversion electrons of Tu^{165} . Table 12 gives the relative intensities of the conversion transition lines $h\nu = 77,4$ keV, and in tables 13 and 14 the test relation K/L is compared with the theoretical one for various multi-fields. Figure 9 shows the possible scheme of the decay of Tu^{165} . Table 15 shows the intensity of the γ -rays and of the transitions in the decay of Tu^{165} . On figure 10 the conversion electron curves of Tu^{166} are represented: a) - first series of measurements, b) - second one

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The Spectra of Conversion Electrons of the Neutron Deficient Thulium Isotopes

after 24 hours and c) third series of measurements (after 48 hours) and on figure 11 the decay scheme of Tu^{166} is represented. Figure 12 shows the dependence on the time of the calculation speed upon the maximal values of all base lines of the thulium fraction. Table 16 records the relative productions of nuclei with various A during the reaction of the "deep separation". All these figures and tables are fully discussed and explained by the authors. There are 16 tables, 12 figures and 39 references 8 of which are Slavic.

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(Radiyevyy institut imeni V.G.Khlopina Akademii nauk SSSR)

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PRE. OBRAZHENIY, BK

AUTHORS: Bobrov, Yu.G., Gromov, K.Ya., Dzhelepov, B.S., ^{48-7-5/21} Preobrazhenskiy, B.K.

TITLE: The Spectra of Conversion Electrons of the Neutron Deficient Lutetium Isotopes (Spektry konversionnykh elektronov neytrono-defitsitnykh izotopov lyutetsiya)

PERIODICAL: Izvestiya Akad. Nauk SSSR, Ser. Fiz., 1957, Vol. 21, Nr 7, pp. 940 - 953 (USSR)

ABSTRACT: The spectra of the conversion electrons of two lutetium preparations were investigated. One of them was obtained from a tantalum target wall which had been irradiated by protons in the course of 3 months and the other one from a target which had been irradiated in the course of 1 1/2 hours. The measurements of the first preparation began weeks after the irradiation and lasted half a year, those of the second one began 3 hours after the separation and lasted 2 months. In the first case the chromatographic separation took place one week after the irradiation and in the second case 30 hours after irradiation. Lutetium possesses 2 stable isotopes: Lu¹⁷⁵ and Lu¹⁷⁶. Table 1 shows the neutron deficient lutetium isotopes according to published data, where

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The Spectra of Conversion Electrons of the Neutron Deficient Lutetium Isotopes

the conversion electrons according to the half-decay periods are divided into 3 groups (150 - 200 days, 8 days and 2 days):
1.) Conversion electrons of lutetium isotopes with a half-decay period of 150 - 200 days.

On table 2 the authors represented their values of the energy and the relative intensities of the conversion lines of the first group and in figure 1 the spectrum of the conversion electrons. Table 3 records the comparison of the test relations K/L and $L_{III} (L_{II} + L_I)$ with the theoretical ones for various multifields and table 4 records the comparison of the experimental data K-L with the theoretical ones for various Z. Figure 2 shows the possible scheme of the Lu^{174} decay and figure 3 shows the scheme of the Lu^{173} decay. Table 5 gives the comparison of the relative intensities of the γ -rays and the conversion electrons (α_K for the transition 78,7 keV is assumed as 5,7).

2.) Conversion electrons of lutetium isotopes with a half-decay period of 7 - 8 days.

The conversion lines of the 1 week isotopes were noticed in the spectrum of the preparation of a lasting as well as a short irradiation. Figure 4 represents the spectrum of the conversion electrons of the lutetium isotopes with $T \sim 8$ days. Table 6

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The Spectra of Conversion Electrons of the Neutron Deficient Lutetium Isotopes

gives the energy and the relative intensities of the conversion lines of the lutetium isotopes with $T \sim 8$ days and table 7 gives a comparison of experimental and calculated relations K/L and $(L_I + L_{II})/L_{III}$.

3.) Conversion electrons of lutetium isotopes with a half-decay time of ~ 2 days.

These conversion electrons were only observed in the spectrum of a shortly irradiated preparation. Table 8 shows a comparison of the energy and the relative intensities of the conversion lines observed in the lutetium preparation with the energies and the intensities of the lines γ^{b169} . Figure 5 records the storing and the γ^{b169} -decay in the lutetium preparation with short irradiation. On table 9 the authors state the conversion lines of the lutetium isotopes discovered by them with $T \sim 2$ days and on table 10 they give a comparison of the test relations K/L and $L_I + L_{II} / L_{III}$ with the theoretical ones for the transition $84,3^{I}_{keV}$. Table II records a comparison of the experimental data of the difference $K - L$ with the X-ray values. There

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The Spectra of Conversion Electrons of the Neutron Deficient Lutetium Isotopes
are 10 table, 6 figures and 10 references, 5 of which are Slavic,

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PREOBRAZHENSKIY, B.K.

48-7-7/21

AUTHORS:

Dzhelepov, B.S., Preobrazhenskiy, B.K., Rogachev, I.M.,
Tishkin, P.A.

TITLE:

The Spectrum of the Conversion Electrons of No¹⁶⁰
(Spektr konversionnykh elektronov No¹⁶⁰)

PERIODICAL:

Izvestiya Akad. Nauk SSSR, Ser. Fiz., 1957, Vol. 21, Nr 7,
pp. 962 - 965 (USSR)

ABSTRACT:

The spectra of the conversion electrons of the erbium and holmium fractions were investigated by means of two lens spectro-meters. These fractions had been won from tantalum which was irradiated with the energy of 660 MeV.

1.) The spectrum of the conversion electrons of a one day isotope was investigated in several series as long as the source did not decay. After 24 hours, after the elimination of the source, the spectrum manifested itself as shown in figure 1. The half-decay period for the lines which are given in table 1 lie in the domain of 25 to 30 hours which justifies the assumption that all lines of table 1 belong to one isotope. The comparison with published data shows that the observed activity is probably con-

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The Spectrum of the Conversion Electrons of Ho^{160}

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nected with Er^{160} . It was shown in earlier works that Ho^{160} in the ground and isomeric states is obtained from the decay of Er^{160} .

2.) The holmium fraction was investigated by means of a two-lense spectrometer. Two preparations were investigated: The first one contained besides Ho^{160} an admixture of Er^{160} , therefore the decay curves have a complicated form. The second source was again cleaned; first the erbium fraction was eliminated and after 25 hours the pure holmium Ho^{160} ; the intensity of all lines agreed with the period $5,3 \pm 0,2$ hours. Moreover 4 series of measurements in energy intervals of 2 - 200 keV were carried out. The total view of the obtained electron spectrum is represented on figure 2. Table 2 records the line energies and their identification. There are 2 tables, 2 figures and 5 references, 3 of which are Slavic.

ASSOCIATION: Leningrad State University imeni A.A.Zhdanov
(Leningradskiy gos. universitet imeni A.A.Zhdanova)

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PREOBRAZHENSKIY, B.K.

48-7-15/21

AUTHORS: Gorodinskiy, G.M., Murin, A.N., Pokrovskiy, V.N.,
Preobrazhenskiy, B.K.

TITLE: On Neutron Deficient Isotopes of Rare Earths which Form as the
Result of the Reaction of a "Deep" Separation of Ta under Irra-
diation by Protons with an Energy of 660 MeV
(O neytronodefitsitnykh izotopakh redkikh zemel' obrazuyushchikh-
sya v rezul'tate reaktsii glubokogo otshchepleniya Ta pri ob-
luchanii protonami energii 660 MeV)

PERIODICAL: Izvestiya Akad. Nauk SSSR, Ser. Fiz., 1957, Vol.21, Nr 7,
pp. 1004 - 1012 (USSR)

ABSTRACT: The rare. earths were chosen for the study, since the neutron
deficient isotopes of the lanthanides which form in the reaction
are little investigated and sometimes also unknown. A tantalum
target was irradiated by a synchronous cyclotron from the United
Institutes for Nuclear Research. The separation of the rare
earths was carried out chromatographically. The study of indi-
vidual fractions was principally performed by the scintillation
method by means of a γ -spectrometer and γ - γ -coincidences.
The scintillation- γ -spectrometer constructed by the authors is

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On Neutron Deficient Isotopes of Rare Earths which Form as the Result of the Reaction of a "Deep" Separation of Ta under Irradiation by Protons with an Energy of 660 MeV

fully explained. The use of a lead collimator with an aperture in the form of a truncated cone proved to be best for determining the relative intensities of γ -lines. In order to remove the X-ray fluorescence of lead, tantalum-tin and copper foil were glued inside the cone. Then the investigation of the line forms is described and formulae are given for the calculation of the efficiency coefficient of the γ -quantum number and of others. By means of these formulae those were calculated for quite a number of X-ray and γ -quantum energies. The resulting data are represented on figure 1. A detailed interpretation of the measurement results is given namely for the isotopes Lu, Yb and Tu with the mass numbers from 173 to 165. Figure 2 shows the γ -spectrum of Lu^{173} and figure 3 shows the decay scheme for Lu^{173} . Figure 4 represents the γ -spectrum of Tu^{167} in the section of small energy. Figure 5 records the decay scheme of Tu^{167} and figure 6 the probable decay scheme of Tu^{166} . There are 6 figures and 15 references, 6 of which are Slavic.

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On Neutron Deficient Isotopes of Rare Earths which Form as the Result of the
Reaction of a "Deep" Separation of Ta under Irradiation by Pro-
tons with an Energy of 660 MeV

ASSOCIATION: Radium Institute im. V.G. Khlopina, AN USSR
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Card 3/3

Preobrazhenskiy, B. K.

AUTHORS: Gromov, K., Ya., Dzhelepov, B. S., Dmitriyev, A. G. 48-12-3/15
Preobrazhenskiy, B. K.

TITLE: On the Decay-Scheme of Lu^{171} (O skheme raspada Lu^{171}).

PERIODICAL: Izvestiya AN SSSR, Seriya Fizicheskaya, 1957, Vol. 21, Nr 12,
pp. 1573-1575 (USSR)

ABSTRACT: The spectrum of the conversion-electrons of a lutetium-preparation which was separated from hafnium obtained in the deep splitting off on tantalum was here investigated. Some conversion-lines whose intensity decreased during a period of 7-8 days were obtained. The obtained value of the half-decay period and the taking into consideration of the genetic connection between lutetium and hafnium permitted clearly to ascribe this conversion-lines to lutetium 171. The lutetium-preparation separated from hafnium was many times weaker than those directly separated from tantalum. Therefore the most intensive and most favorably situated conversion-lines were determined in the former. Thus it may be stated that the transitions with $h\nu = 75,8$ and $90,6$ keV and the non-identified conversion-lines $E = 56,6; 57,9; 62,3$ keV, which were found in the spectrum of the lutetium separated from hafnium belong to lutetium 171. The inverse fact, however, may not be

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On the Decay-Scheme of Lu^{171}

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maintained: not discovered conversion-lines may either belong to lutetium 171 or to lutetium 172. Starting from the obtained data something can be said on the decay-scheme of Lu^{171} . The spin of the ground state of Yb^{171} was measured in reference 3 and is equal to $1/2$. The Lu^{171} -nucleus has 71 protons and 10 neutrons, therefore (reference 4) its spin must be the same as in Lu^{175} (71 protons and 104 neutrons), i.e. $7/2$. Thus an image is obtained which is very similar to the decay of Yb^{169} (spin $7/2$) in Tu^{169} (spin $1/2$). It would be justified to assume that the decay-scheme of Lu^{171} is also similar to that of the Yb^{169} -decay. In analogy with the decay-scheme of Yb^{169} a scheme of the rotation-band-levels of the ground state of Yb^{171} was set up. The experimental data are in very good agreement with this scheme. It is shown that the Lu^{171} -decay apparently is mainly spent on high excitation-states with a quantum-number $K > 1/2$ and that it is very probably that all or part of the γ -transitions and non-identified conversion-lines which are not connected with the ground-rotation-band of Yb^{171} are produced in the discharge of these excitation-states. The conversion-lines corresponding to the $h\nu = 11,3$ (m-shell) and $26,2$ keV (L-, M- and N-shells) were observed in the Lu^{171} -spectrum by

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On the Decay-Scheme of Lu¹⁷¹

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I.M.Rogachev (State University Leningrad) with the aid of a
Pens-spectrometer. The M-11,3 line is badly visible, as it lies
near the Auger-electron-lines L-MM and L-NN. There are 1 figure,
1 table, and 5 references, 4 of which are Slavic.

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Preobrazhenskiy, B. K.

48-12-11/15

AUTHORS: Gorodinskiy, G. M. , Murin, A. N. , Pokrovskiy, V. N. , Preobrazhenskiy, B. K.

TITLE: On Isotopes of Rare Earths With a Deficiency of Neutrons That Form in Deep Splitting (Spallation) of Ta by Protons With an Energy of 660 MeV. Information II(0 neytrono defitsitnykh izotopakh redkikh zemel', obrazuyushchikhsya v rezul'tate reaktsii glubokogo rasshchepleniya Ta protonami energii 660 MeV. Soobshcheniye II)

PERIODICAL: Izvestiya AN SSSR, Seriya Fizicheskaya, 1957, Vol. 21, Nr 12, pp. 1624 - 1632 (USSR)

ABSTRACT: Elements of the group of rare earths were separated from a tantalum-target. The latter was on a synchrocyclotron irradiated by rapid protons with 660 MeV and chromatographically separated. The results for the isotopes A from 160 to 134 are given here. A = 160. The observed isotopes Er and Ho with the mass number 160 form a genetic chain. The Er¹⁶⁰-decay is according to reference 2 not accomplished by a γ -quantum-emission. This was again confirmed here. Thus the Er¹⁶⁰-decay immediately passes to the original and isomeric level of Ho¹⁶⁰. The existence of the isomer Ho^{160m} ($T_{1/2} = 5$ hours) was definitely determined in reference 3. Experiments were made for determining the relative probability of the transi-

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On Isotopes of Rare Earths With a Deficiency of Neutrons That Form in Deep Splitting (Spallation) of Ta by Protons With an Energy of 660 MeV. Information II.

tions to the isomeric and original(ground-) level of Ho^{160} . The results are given here. A = 159: Among others the long-lived isotope Dy^{159} ($T_{1/2} = 134$ days) which does not emit any γ -rays was separated. A = 157: In the fraction Dy (which was purified of Y) an activity which declined with $T = 8,5$ hours was determined. A = 156: A presence of Tb^{156} in the fraction Tb is possible. A = 155: The line 227 keV was very distinctly determined in the γ -spectrum of the fraction Dy. The intensity of this line decreased with $T_{1/2} = 10$ hours. Besides it was determined that Tb with a half-decay period of about 5 days develops in the decay of the isotope Dy with $T_{1/2} = 10$ hours. It is assumed that if Tb^{156} were present among the products of separation of Ta, its γ -spectrum would closely coincide with the γ -spectrum of Tb^{155} . A = 154: The presence of the isotope Tb^{154} in the fraction is possible. A = 153: Among the Dy-isotopes is Dy^{153} which possesses a half-decay period of 10 hours without emitting γ -quanta. A = 151: An activity with $T_{1/2} = 20$ hours was determined in the Tb-fraction. A long-lived isotope Gd^{151} with $T_{1/2} = 150$ days is present in the Gd-fraction and probably among the daughter-elements of Tb. A = 149: The spectrum of Gd^{149} contains the lines 150, 300, 347 and 520 (probably a double-

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28-12-11/15

On Isotopes of Rare Earths With a Deficiency of Neutrons That Form in Deep Spallation (Spallation) of Ta by Protons With an Energy of 660 MeV. Information II.

-line) keV. A = 147: Activities with $T_{1/2} = 1,5$ days and 60 days which do not correspond to any known Gd isotope were determined in the Gd-fraction. Some time after the separation Eu¹⁴⁷-lines occurred in the γ -spectrum of the Gd-fraction. Important conclusions on the relative intensity of the lines were drawn. 1.) The presence of the coincidence-peaks of the lines 120 and 200 keV with X-radiation (40 keV) indicates a coincidence of the γ -quanta with the X-rays of Sm¹⁴⁷. This is confirmed by the direct tests in the scheme of the γ - γ -coincidences. The lines 120 and 200 keV themselves do not yield any coincidence. 2.) The line 80 keV formally considered as really existing (reference 11) in reality is the peak of the coincidence of X-rays developing during K-capture and conversion. 3.) By evaluation of the intensity of this peak an evaluation of the conversion-coefficients can be obtained. A = 145: The activity with $T_{1/2} \sim 60$ days was determined in the Gd-fraction and classified with the isotope Gd¹⁴⁵. The γ -spectrum of Gd¹⁴⁵ consists of 115 keV-lines. The lines 640 and 750 keV belong to Eu¹⁴⁵. According to precise data the γ -spectrum of Eu¹⁴⁵ ($T_{1/2} \sim 5$ days) consists of the lines 636 and 745 with the relative intensities 1,0 and 2,3. A = 140: The activity with $T_{1/2} \sim 3,5$ days

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48-12-11/15

On Isotopes of Rare Earths With a Deficiency of Neutrons That Form in Deep Splitting (Spallation) of Ta by Protons With an Energy of 660 MeV. Information II.

discovered in the Nd-fraction was ascribed to Nd^{140} ($T_{1/2}=3,3$ days). The only distinctly visible annihilation-line 510 keV and also positrons with 2,3 MeV were noticed in the γ -spectrum of the Nd-fraction. A = 139: In the γ -spectrum of the Pr-fraction an annihilation-line 510 keV was noticed whose intensity decreased with $T_{1/2} \sim 4$ hours. It was ascribed to the Pr^{139} -decay ($T_{1/2}=4,2$ hours according to reference 5). A = 134: The existence of the genetic chain $Ce^{134} \xrightarrow{52 \text{ hours } K} La^{134} \xrightarrow{6,5 \text{ minutes } K, \beta}$ with the characteristics described in reference 5 was confirmed. Finally some observations on non-identified activities are given. In the work participated: V. P. Dzhelepov, V. N. Mekhedov, V. A. Khal-kin, B. S. Dzhelepov, N. M. Anton'yeva, A. A. Bashilov, A. V. Kal'yamin, O. M. Lilova. There are 7 figures, and 15 references, 9 of which are Slavic.

ASSOCIATION: Radium Institute im. V. G. Khlopin AS USSR
(Radiyevy institut im. V. G. Khlopina Akademii nauk SSSR)

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Card 4/4

Preobrazhenskiy, B. K.

48-12-14/15

AUTHORS: Berlovich, E. Ye. , Gvotovskiy, K. M. , Borits, M. P. , Breslav, V. I. , Preobrazhenskiy, B. K.

TITLE: Investigation of the Lives of Low Nuclear Levels Excited in Electron-Captures (Issledovaniye vremen zhizni nizhnikh urovney yader, voz-buzhdayemykh pri elektronnom zakhvate)

PERIODICAL: Izvestiya AN SSSR, Seriya Fizicheskaya, 1957, Vol. 21, Nr 12, pp. 1643 - 1652 (USSR)

ABSTRACT: The lives of the levels of some nuclei which are produced by means of capture of orbital electrons are investigated here. All initial nuclei belong to nuclei with a deficiency of neutrons. The nuclei are produced in "deep" separations under the action of neutrons with high energies. The paternal nuclei Tu^{167} , Eu^{147} and Gd^{145} were obtained in the tantalum-target by radiation by protons with 660 MeV in the synchrocyclotron. The thulium-, europium- and gadolinium-sources were produced according to the chromatographic method. The paternal nuclei of Ir^{190} were obtained by means of radiation of a bismuth target from which they were separated with the aid of an iridium-carrier. The measurement of the life was performed according to the method of retarded coincidences in an apparatus already earlier described by one of the authors (references 2 - 4). The co-

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Investigation of the Lives of Low Nuclear Levels Excited in Electron-Captures

incidences of the characteristic X-rays with the γ -rays ($X\gamma$ - and γX -coincidence) or with the electrons of internal conversion (Xe- and eX-coincidence) were measured here. The transitions $Tu^{167} \rightarrow Er^{167}$, $Gd^{145} \rightarrow Eu^{145}$, $Eu^{147} \rightarrow Sm^{147}$, $Ir^{190} \rightarrow Os^{190}$ were investigated. It is shown that in the Er^{167} -nucleus the electric quadrupole-transition is highly accelerated, whereas the magnetic dipole-transition is highly retarded. The former is natural for an Er^{167} -nucleus with 17 neutrons over the filled shell and which belongs to the greatly deformed nuclei. The sound transition belongs to the group of retarded magnetic dipole-transitions (reference 19). The cause of the retardation is apparently connected with the collective nature of the magnetic transition. The interpretation of the measurement-results for the $Gd^{145} \rightarrow Eu^{145}$ -transition is not only not possible because the multipolarity of the γ -transitions of Eu^{145} is known, but also because there exists uncertainty in the identification of the γ -rays (115 keV) investigated. The obtained value for the upper limit of the life of the first excited state of Sm^{147} , on the assumption that the transition ($E2 + M1$) is a mixed type, for the time of radiation with the taking into account of conversion yields a somewhat higher value for the upper limit $T_{\gamma} \leq 5.10^{-10}$ sec. It is shown that the result obtained

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Investigation of the Lives of Low Nuclear Levels Excited in Electron-Captures 48-12-14/15

here contradicts the assumption that $E2 + M1$ is a mixed type.
 $\tau_{\gamma} = 1,2 \cdot 10^{-9}$ sec is obtained from the observed value for the
 average life of the first excited state of $^{76}\text{Os}^{190}$ with the tak-
 ing into account of the conversion on all shells and on the assump-
 tion that $\alpha = 0,71$.
 B. S. Dzhelepov and collaborators, A. A. Bashilov and collaborators,
 as well as A. N. Murin and collaborators before publication placed
 data on their experiments with the isotopes investigated here at
 the authors' disposal. V. P. Dzhelepov and the personnel of the
 synchrocyclotron participated in the work. There are 8 figures,
 and 23 references, 12 of which are Slavic.

ASSOCIATION: Physico-Technical Institute AN USSR, Leningrad
 (Leningradskiy fiziko-tekhnicheskii institut Akademii nauk SSSR)

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Card 3/3

PREOBRAZHENSKIY, B.K.

AUTHOR: Preobrazhenskiy, B.K., Lilova, O.M.

32-9-13/43

TITLE: The Purification of Lactic Acid for Chromatographical Purposes
(Ochistka molochnoy kisloty dlya khromatograficheskikh tseley)

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, Nr 9, pp 1071-1071 (USSR)

ABSTRACT: The following method was employed for the purification of lactic acid. To a certain quantity of technical lactic acid, a calculated quantity of zinc oxide was added in form of a dough-like mass, which had been obtained by the crushing of the zinc-oxide powder with some water. The quantity of zinc-oxide necessary for neutralizing the acid is determined on a small portion of acid which is 1.5-2-fold diluted. Neutralization is judged by the addition of a drop of the mixture to the soda solution. The cease of CO₂ separation indicates that neutralization has been attained. Usually, about 200 g zinc-oxide are necessary for one liter of technical lactic acid. There follows a detailed description of the purification process.

ASSOCIATION: Radium Institute imeni V.G.Khlopina AN USSR (Radiyevyy institut im. V.G.Khlopina Akademii nauk SSSR)

AVAILABLE: Library of Congress

Card 1/1

PREOBRAZHENSKIY, B.L.
GORODINSKIY, G.M.; MURIN, A.N.; POKROVSKIY, V.N.; PREOBRAZHENSKIY, B.L.

Neutron-deficient isotopes of rare earths forming as a result of Ta fission reaction obtained by 660 Mev proton bombardment. Izv. AN SSSR. Ser. fiz. 21 no.7:1004-1012 J1 '57. (MLRA 10:9)

1. Radiyevyy institut imeni V.G. Khlopina Akademii nauk SSSR.
(Earth, Rare--Isotopes)

KRIZANSKIJ, L.M.; MALY, J.; MURIN, A.N.; PREOBRAZENSKIJ, B.K.

Fission products of the isotopes of cesium and rare earths resulting from the fission of Pu^{239} with neutrons from nuclear reactor. Jaderna energie 3 no.5:139-140 My '57.

1. Radiyevyy institut Akademii nauk S.S.S.R., Leningrad (for Krizanskiy, Murin and Preobrazenskiy). 2. Ustav jaderne fysiky, Ceskoslovenska akademie ved, Praha (for Maly).

AUTHOR: GUSEV, I.A., LILOVA, O.M., MURIN, A.N., PREOBRAZHENSKIY, B.K.,
YAKOVLEV, V.A. 56-6-50/56
TITLE: The Gadolinium Isotope with the Mass Number 146. (Ob izotope
gadoliniya s massovym chislom 146, Russian)
PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 6, p 1585
(U.S.S.R.)

ABSTRACT:

On the occasion of the irradiation of tantalum with 660-MeV protons new gadolinium isotopes are produced, which have hitherto not been mentioned in publications. On the occasion of the decay of these isotopes known europium isotopes are in some cases produced, with the aid of which the mass number of the mother substances, i.e. of the new gadolinium isotopes can be determined. In the europium fractions obtained from pure fractions of gadolinium (they were obtained 32 hours after irradiation ended) a radioactive isotope can be observed which decays with a period of 1,6 days. According to tables published this is Eu^{146} . The modification of the activity of this isotope from the time of its separation from the gadolinium fraction onwards makes it possible to estimate the period of the mother substance Gd^{146} at 12 ± 4 hours. It must further be noted that the mass

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The Gadolinium Isotope with the Mass Number 146.

56-6-50/56

number of the gadolinium was determined with the same degree of accuracy as in the case of the europium isotope, which was produced as a "daughter substance".

According to SEABORG'S tables this europium isotope belongs to the class C (the mass number is reliable or probable).

ASSOCIATION: Radium Institute of the Academy of Science of the U.S.S.R.
PRESENTED BY:
SUBMITTED: 21.3.1957
AVAILABLE: Library of Congress

Card 2/2

PREOBRAZHENSKIY B.K.

C-5

USSR/Nuclear Physics - Nuclear Reaction

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 514

Author : Gorodinskiy, G.M., Murin, A.N., Pokrovskiy, V.N.,
Preobrazhenskiy, B.K., Titov, N.Ye.

Inst : Radium Institute, Academy of Sciences, USSR.

Title : Radioactive Isotopes of Rare Earth, Produced by Spallation
Reactions.

Orig Pub : Dokl. AN SSSR, 1957, 112, No 3, 405-406

Abstract : An investigation was made of spallation by irradiation of
Ta by 680 Mev protons in the phasotron of the Joint Insti-
tute for Nuclear Research. The long-lived radio isotopes
obtained thereby were isolated and separated chromatogra-
phically. The half-lives, the type and energy of radia-
tion were determined, and multiple gamma-spectra were made
with a scintillation spectrometer with NaI (Tl) and CsI

Card 1/3

C-5

USSR/Nuclear Physics - Nuclear Reaction

'Abs Jour : Ref Zhur - Fizika, No 1, 1958, 514

(Tl). The following results were obtained. The isotopes Ce^{134, 139} have characteristics that coincide with those previously indicated (Mollander I. et al., Reviews of Modern Physics, 1953, 25, 469). The isotope Nd¹⁴⁰ with $T_{1/2} = 3.3$ days has two adjacent gamma lines in the region 0.5 Mev, a group of weak lines in the region 0.26 -- 0.32 Mev, a 0.19 Mev, and a weak line 0.11 Mev. Eu¹⁴⁵ ($T_{1/2} = 5$ days) has four weak gamma lines of 0.63, 0.66, 0.73, and 0.89 Mev and has many weak lines in the region 0.30 -- 0.45 Mev. Eu¹⁴⁷ ($T_{1/2} = 24$ days) has a strongly converted 0.080 Mev line and two intense lines 0.124 and 0.200 Mev. Gd¹⁴⁷ has gamma lines of 0.232, 0.373, and 0.385 Mev with gradually diminishing intensities. Gd¹⁴⁹ ($T_{1/2} = 70 \pm 5, 9, \text{ and } 1.5$ days) has gamma lines 0.154, 0.292, 0.350, and 0.505 Mev. Gd¹⁵¹ has a 0.115 (weak) gamma line and lines of 0.638, 0.750 Mev. Tb¹⁵¹ (or Tb¹⁵², $T_{1/2} = 20$ hours) and Tb¹⁵² (or Tb¹⁵³, Tb¹⁵⁴)

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USSR/Nuclear Physics - Nuclear Reaction

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Abs Jour : Ref Zhur - Fizika, No 1, 1958, 514

have a poorly resolvable spectrum. Dy¹⁵⁷ has 0.233 and 0.325 Mev lines, $T_{1/2} = 8$ hours. Ho¹⁶⁶ (T = 5 hours) has, in addition to the lines indicated earlier (Referat Zhur Fizika, 1955, No 11, 24167), two weak 0.29 and 0.51 Mev lines. The half-lives of Yb¹⁶⁶, Yb¹⁶⁹, Lu¹⁶⁹, and Lu¹⁷⁰ were found to be 60 hours, 31 days, 1.7 days, and two days respectively. A spectrum of Tm¹⁶⁶ consists of 0.080, 0.180, 0.690, and 0.780 Mev gamma lines. It is ascertained that the 0.26 Mev belongs to Yb¹⁶⁹.

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20-4-15/51

A Study of the β^+ -Decay of Ho^{160} .

are given. The half life is equal for all components of the spectrum and amounts to $5,6 \pm 0,7$ hours. From an analysis of the results obtained here two problems arise: 1) To which of the holmium isotopes appertains the positive radiation? 2) By what process are these positrons produced? Are they actually a result of the β^+ -decay or are these positrons corresponding to a pair conversion of the corresponding transitions? From the considerations of the authors the following springs: Because of the fact, that the β^+ spectrum with a half life of 5,6 hours was observed from a source, which was separated from Er after 45 hours, the assumed Ho^x is obtained from Er^x just like Ho^{160} . (H^x denoting an unknown holmium isotope). 2) The fact, that the ratio S_{β^+}/S_{e^-} from both sources is equal, speaks in favour of a conversion similarity not only of the periods of Ho^{160} and Ho^x , but also of the periods of Er^{160} and Er^x . The fraction of Erbium, which had been kept for 110 hours after the separation was used in an additional experiment, which furnished the same results. The greater number of electrons is probably coming from the β^+ -decay of Ho^{160} . The mass difference between Ho^{160} and Dy^{160} amounts to a value of not less than 2920 ± 100 keV. Further details are given.

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A Study of the β^+ - Decay of Ho^{160} .

20-4- 15/51

There are 2 figures, 1 table and 7 references, 4 of which are Slavic.

ASSOCIATION: State University imeni M. V. Lomonosov, Leningrad (Leningradskiy gosudarstvennyy universitet imeni M. V. Lomonosova).

SUBMITTED: July 22, 1957.

AVAILABLE: Library of Congress.

Card 3/3

PREOBRAZHENSKIY, B. K.

20-1-13/42

AUTHORS:

Grigor'yev, Ye.P., Dzhelepov, B. S., Corresponding
Member of the AN SSSR, Zolotavin, A. V., Kratsik, B.,
Preobrazhenskiy, B. K., Yanchevskaya, I. S.;

TITLE:

The Conversion Spectrum of Ho^{160} (Konversionnyy spektr Ho^{160}).

PERIODICAL:

Doklady AN SSSR, 1957, Vol. 117, Nr 1, pp. 53 - 56 (USSR)

ABSTRACT:

The present paper investigates the conversion spectrum occurring in the radioactive transformation Er^{160} Ho^{160} Dy^{160} . The spectrum was investigated by means of a spectrometer with a double focusing. The conversion spectrum is homogeneous in both fractions: Er^{160} does not produce any conversion electrons and all the electrons belong to the Ho^{160} . The results of the investigations of the conversion spectrum are given in a table. The intensity of all the lines observed decreased in a period corresponding to the half-value period of the investigated fractions: 29 hours in the case of the erbium fraction and 5 hours of the holmium fraction. On measuring faults something is said, too. The general form of the conversion spectrum agrees with an earlier discovered form (reference 2). Moreover, some new facts could be explained, which permit the determination of the decay scheme of the Ho^{160} : The lines L_I+L_{II} , L_{III} , M and N of the transition taking place in the Ho^{160} were observed with 60 KeV. The decomposition into the components makes it possible to determine the relative intensity of the lines. The relationship $L_I:L_{II}:L_{III} =$

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The Conversion Spectrum of Ho^{160} .

20-1-13/42

$= 0,2:1, 1:1,0$ determined by the authors for the transition 86,4 keV confirms the multipole property $E 2$ of which. The line $E_e = 99,3$ keV discussed in a preparatory paper (reference 2) was identified as the L-line of the transition 107 keV by the authors. Moreover the K-conversion line of this transition was found. The conversion line of the transition 298 keV on the K-shell is a narrow doublet with $\Delta E \sim 1$ keV. Further particulars on these new discovered lines are given. The data given here and the data on the decay of the Tb^{160} (references 7,8,9,10,11,12) can be used as fundament for the construction of the decay scheme of Tb^{160} and Ho^{160} . Such a scheme is illustrated by a graph. There are 3 figures, 2 tables, and 12 references, 5 of which are Slavic.

ASSOCIATION: Physics Institute of the Leningrad State University im. A.A. Zhdanov
(Fizicheskiy institut Leningradsnogo gosudarstvennogo universiteta im. A. A. Zhdanova).

SUBMITTED: September 15, 1957

AVAILABLE: Library of Congress

Card 2/2

PREOBRAZHENSKIY, B. K.

78-1-22/43

AUTHOR: Preobrazhenskiy, B. K.

TITLE: A Practical Device for Chromatographic Separations (Ratsional'noye ustroystvo dlya khromatograficheskikh razdeleniy).

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 1, pp. 119-120 (USSR).

ABSTRACT: Rapid separations of rare earths and trans-plutonium-elements on cationites are usually carried out at $\sim 90^{\circ}\text{C}$. In order to prevent the formation of bubbles in the column, the washing-out solution (eluent) was previously ridded from the gas by heating up to the same temperature in the supply tube. This method, however, has not proved sufficiently effective, especially with high pressure, because of very rapid separation on small particles of resin. The solubility of the air in the eluent is increased to such an extent by the high pressure that the heating remains ineffective. A great pressure drop is formed in the column, whereas in the lower part, where the pressure falls down to the atmospheric value, bubbles are formed in abundant quantity. This occurs even in cold columns under high pressure. The author proposes a simple facility, which has proved successful as a preventive measure (figure 1). The pressure on the solution is effected out here not immediately by the air, but by means of a hollow gas-float on the solution- of about 5 cm of length, closely adjacent to the walls of

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A Practical Device for Chromatographic Separations

78-1-22/43

the tube and to the washing out solution. This solution is (if heating is provided) previously ridded from gas by heating up to the boiling point. The floater prevents the solution of air in the eluent and its subsequent separation in the resin-layer. A thoroughly heated supply tube is consequently no longer required. One container is sufficient for the separation of a small number of elements. The concentration of the eluent is automatically controlled according to standards, for the purpose of separating mixtures with many components. That amount of concentrated solution flows from the upper vessel into the lower one, and that with the same velocity, as passes from the lower vessel (with lower concentration) into the column with resin (figure 1). The capacities of the vessels and the concentrations are selected in such a way that the concentration varies with a velocity required. A strict reproducibility of the results is achieved by this. The filling of the vessels with thoroughly boiled solutions must take place in such a way that no air bubbles remain. There are 1 figure, and 4 references, 2 of which are Slavic.

ASSOCIATION: Radium-Institute AN USSR, Leningrad (Radiyevyy institut Akademii nauk SSSR Leningrad).

SUBMITTED: June 18, 1957.

AVAILABLE: Library of Congress.

Card 2/2

AUTHORS: *PREOBRAZHENSKIY, B.K.*
Kalyamin, A. V., Murin, A. N., Preobrazhenskiy, B.K., 89-2-21/35
Titov, N. Ye.,

TITLE: The Yield of Rare Earths in the Splitting up of Bismuth by 660 MeV-Protons (Vykhody redkozemel'nykh elementov pri rasshcheplenii vismута protonami s energiyey 660 MeV).

PERIODICAL: Atomnaya Energiya, 1968. *4*, Nr 2, pp. 196-197 (USSR)

ABSTRACT: With the aid of chromatographic methods especially rare-earth products were gathered in the splitting up of Bi²⁰⁹ by 660 MeV -protons and the following cross sections were determined:

1. Ce¹³⁴ ~0,4 mb
2. Nd¹⁴⁰ ~0,25 mb
3. Gd¹⁴⁷ ~0,95 mb
4. Tb¹⁵³ ~0,9 mb
5. Tb¹⁵⁴ ~1,0 mb
6. Er¹⁶⁰ ~2,0 mb
7. Tm¹⁶⁵ ~4,0 mb
8. Yb¹⁶⁶ ~2,5 mb

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The Yield of Rare Earths in the Splitting up of Bismuth by 660 MeV- 89-2-21/35
-Protons.

9. Yb¹⁶⁹ ~7,0 mb

10. Lu¹⁷⁰ ~6,5 mb

11. Lu¹⁷¹ ~5,5 mb

There are 2 figures, 5 references, 4 of which are Slavic.

SUBMITTED: September 30, 1957

AVAILABLE: Library of Congress

Card 2/2

1. Bismuth 209 fission
2. Bismuth 209-Chromatographic analysis
3. Chromatographic analysis-Applications

PREOBRAZHENSKIY, B.K.

Efficient apparatus for chromatographic separation. Zhur. neorg.
khim. 3 no.1:119-120 Ja '58. (MIRA 11:3)

1. Radiyevyy institut Akademii nauk SSSR, Leningrad.
(Chromatographic analysis)

SOV/78-3-9-20/36

AUTHORS: Preobrazhenskiy, B. K., Lilova, O. M., Kalyamin, A. V.,
Pashkov, A. B.

TITLE: On the Dependence of the Ion Exchange Separation of the Rare
Earths on the Hardness, Structure, and Exchange Capacity of
the Resin (O zavisimosti ionoobmennogo razdeleniya redkozemel'-
nykh elementov ot zhestkosti, struktury i obmennoy yemkosti
smol)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 9, pp 2131-2132
(USSR)

ABSTRACT: In the present paper the rapid ion exchange separation of the
rare earths, above all of Lu and Yb was investigated in de-
pendence on the hardness, structure, and exchange capacity of
the resin. KY-2 was used as ion exchange resin. The results
showed that the distribution coefficient of the rare earths in
the presence of complex partners depends on the exchange
capacity of the resin and the selectivity of the complex former
and is practically independent of the hardness and structure
of the resin. If the separation of the rare earths is carried
out by means of ion exchange without the application of a

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SOV/78-3-9-20/38

On the Dependence of the Ion Exchange Separation of the Rare Earths on the Hardness, Structure, and Exchange Capacity of the Resin

complex former a dependence exists between the distribution coefficients and the hardness and structure of the resin. The highest distribution coefficient of the rare earths is obtained with a resin of highest exchange capacity. There are 1 figure and 2 references, 2 of which are Soviet.

ASSOCIATION: Radiyevyy institut Akademii nauk SSSR (Radium Institute, AS USSR) Institut plastmass Ministerstva khimicheskoy promyshlennosti (Plastics Institute, Ministry of Chemical Industry)

SUBMITTED: July 8, 1957

Card 2/2

PROBRAZHENSKIY, B. K.

AUTHORS: Dzhelepov, B. S., Probrazhenskiy, B. K., 48-22-2-3/17
Rogachev, I. M., Tishkin, P. A.

TITLE: The Conversion Electron Spectrum of the Dysprosium Fraction
(Spektr konversionnykh elektronov disproziyevoy fraktsii)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya. 1959
Vol. 22, Nr 2, pp. 126-134 (USSR)

ABSTRACT: Conversion spectra of the neutron-saturated dysprosium isotopes were investigated here. The dysprosium fraction was chemically and chromatographically separated from the tantalum target bombarded with fast protons in the synchrocyclotron ОИЯИ. The irradiation lasted several hours. The separation of the rare earths took place 20-30 hours after the termination of the irradiation. The situation was more complicated than was to be assumed according to the Siborg tables. In the conversion spectrum the authors determined lines whose intensity decreased with half lives of: a) $7,5 \div 11$ hours, b) 38 hours and c) 4,7 days. Due to the difficult situation explanations are here given according to groups of half-lives. The Dy-fraction was investigated in two β -spectrometers with magnetic lenses (magnetic lens

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The Conversion Electron Spectrum of the Dysprosium Fraction 49-22-2-3/17

spectrometer). 1.) In the spectrum of the dysprosium-fraction 15 electron-lines whose intensity decreased with a half-life of $7,5 \div 11$ hours were determined in the range of $3 \div 150$ keV. All lines repeated themselves in 6 series (performed with 2 sources). The value of the half-life of 7,5 hours was determined according to the decrease in intensity of the lines with 7,4 keV. The electron lines with 5,36 and 42 keV are L-LMM, K-LL, K-L, and M Auger-electrons, the lines with 13,5, 57,5, 64,0, 74,0 and 81,0 keV were identified as conversion electrons K, L and M of the transitions with 65,5 and 82,5 keV in Tb. The electron lines with 48,0, 92,0, 98 and 142 keV apparently are K and L conversion electrons which correspond to the transitions with 100 and 150 keV, whereas the line with 132 keV apparently corresponds to the K-electrons of the transition with 184 keV. All transitions given here were for the first time observed by the authors. - 2.) Beside the lines with a time of decrease in intensity of about 10 hours 5 weak electron lines with a time of decrease in intensity of about 38 hours were determined in the β -spectrometer with single lens. For the time being it was not possible to ascribe these lines to a certain isotope. - 3.) After these

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The Conversion Electron Spectrum of the Dysprosium Fraction 48 22.2 3/-

lines (with 10 hours) weaker lines of the conversion electrons, the intensity of which decreased with a half-life of $(4,5 \pm 0,2)$ days became distinctly visible. K-, L- and M-electrons of the transitions with 63 and 87 keV. L- and M-electrons of the transition with 57 keV. K- and L-electrons of the transitions with 149, 163, 180 and 200 keV, K-electrons of the transitions with 60 and 262 keV were determined. Some of these lines could not be identified. - It is shown that the activity decreasing with a period of 4,5 days can be ascribed to the terbium isotopes. It seems that at least 4 terbium isotopes with a half-life period of about 5 days exist:

Tb^{153} ($T = 5,1$ days), Tb^{155} ($T = 5,6$ days), Tb^{157} ($T = 4,7$ days) and Tb^{161} ($T = 6,8$ days). Summarizing the authors state that it is possible that Tb^{155} has a half-life of about 5 days, that it is accumulated from Dy^{157} ($T = 8,2$ hours) and that some conversion lines corresponding to the period of ~ 5 days might belong to it. The decay-scheme was discussed with L. K. Peker, K. Ya. Gromov helped with the organisation of the works. A. Bagdanov and

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The Conversion Electron Spectrum of the Dysprosium Fraction 49.22.2-3/17
A. I. Yashchuk, Student-Diplomants (which prepare for their
diplomas) helped with the work.
There are 5 figures, 3 tables, and 9 references, 3 of which
are Soviet.

ASSOCIATION: Fizicheskiy institut Leningradskogo gosudarstvennogo
universiteta im. A. A. Zhdanova (Institute for Physics
in the Leningrad State University imeni A. A. Zhdanov)

AVAILABLE: Library of Congress

1. Dysprosium isotopes-Conversion spectra
2. Dysprosium isotopes-Irradiation
3. Rare earth elements-Separation

Card 4/4

PREOBRAZHENSKIY B. K.

AUTHORS: Anton'yeva, N. M., Bashilov, A. A.,
Dzhelelov, B. S., Preobrazhenskiy, B. K. 48-22-2-4/17

TITLE: Spectra of the Conversion Electrons of Gd¹⁵¹ and Gd¹⁵³
(Spektry konversionnykh elektronov Gd¹⁵¹ i Gd¹⁵³)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya. 1958.
Vol. 22, Nr 2, pp. 135-152 (USSR)

ABSTRACT: The conversion spectra of some gadolinium isotopes with long periods were investigated here. They were obtained by a long-term irradiation of the tantalum target in a scattered proton-beam with an energy of 660 MeV. First the fraction of rare earths was separated from tantalum according to ordinary chemical methods and then the pure gadolinium fraction which mainly contained neutron-unsaturated isotopes was separated according to the chromatographic method. The active material was collected on a thin aluminum foil. The investigation of the spectrum of conversion electrons was performed by means of the magnetic spectrometer - the ketron of the University of Leningrad (ref. 2) which has a dissolving power of 0,5%. The film at the counter slit permits electrons

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Spectra of the Conversion Electrons of Gd^{151} and Gd^{153}

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to pass with an energy of more than 7 keV. The measurements of spectrum were made one month after the termination of the target irradiation and were several times repeated in the course of the following year. It became evident that the slowly changing part of the conversion spectrum belongs to Gd^{153} and Gd^{151} . Moreover the lines belonging to the gadolinium isotopes with shorter periods, which the authors had become acquainted with in earlier investigations, were observed. At first the spectrum of the conversion electrons of Gd^{153} is dealt with here. A survey of the data published on Gd^{153} is given. From the comparison of those is concluded that the part of the conversion spectrum investigated here belongs to Gd^{153} . It is shown that in the transition with 103,3 keV the ratio $K:L = 6,4 \pm 0,3$ indicates that this transition predominantly belongs to the $M\ 1$ - type (perhaps with a small $E2$ -admixture). In the transition with 97,4 keV the magnitude of the ratio $K:L = 6,9 \pm 0,5$ indicates that this transition either belongs to $M\ 1$ or $E\ 1$. In the 83,6 keV-transition the ratio $K:L$ shows that in this case $E\ 2$, possibly with an $M\ 1$ - admixture exists. In the 69,8 keV-transition the ratio $K:L = 6 \pm 1$ shows that here most

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Spectra of the Conversion Electrons of Gd^{151} and Gd^{153}

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probably a mixture of M 1 + M 2 exists. - Regarding the decay-scheme some precise determinations were made here on the intensities of the transitions in the decay $Gd^{153} \rightarrow Eu^{153}$. It is shown that the intensity of the transition to the ground level amounts to $< 10\%$, $1g ft \sim 7.5$. The 173 keV - level is excited by an intensity of $\sim 12\%$, $1g ft \sim 4.7$. The most intensively excited ones are the 103,3 keV - level with an intensity of $\sim 46\%$, $1g ft \sim 5.9$ and the 97,4 keV - level with $\sim 32\%$, $1g ft \sim 6.2$. The first level of rotation of the fundamental band with 84 keV (the lowest of all known Eu^{153} -levels) is weakly excited, its intensity amounts to $\sim 6\%$. Its excitation is most probably connected with the nuclear transmutations to Eu^{153} . For an explanation of the obtained $1g ft$ - values it can be assumed that the spin of Gd^{153} is equal to $3/2$. In the spectrum of the conversion electrons with an activity of long periods obtained here a great number of other lines remained after the deduction of the Gd^{153} -lines. The transition with 21,7 keV observed here is, according to the explanations given here, excited in the decay $Gd^{151} \rightarrow Eu^{151}$. It is shown that

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Spectra of the Conversion Electrons of Gd^{151} and Gd^{153}

48-22-2-4/17

this transition most probably represents a mixture of $M^{+1} + E 2$, as the L_1 -peak is considerably higher than the L_2 - and L_3 -peaks and as the same time $L_3 \sim L_2$. Further transitions are shown and it is stated that by the decay of Gd^{151} to Eu^{151} and by a Coulomb excitation of the latter mainly different nuclear levels and transmutations are produced. Then the decay-scheme of Gd^{151} is given, where two variants are shown. The second variant differs by the fact that here the 155 keV-transition to the ground state of Eu^{151} takes place. V. Il'in, L. Klochova and L. K. Peker helped with the work. There are 7 figures, 10 tables, and 36 references, 7 of which are Soviet.

ASSOCIATION: Fizicheskii institut Leningradskogo gosudarstvennogo universiteta im. A. A. Zhdanova (Institute for Physics of the Leningrad State University imeni A. A. Zhdanov)

AVAILABLE: Library of Congress

1. Gadolinium Electrons-Conversion spectra
2. Gadolinium isotopes-Irradiation

Card 4/4

PREOBRAZHENSKIY, B. K.

48-22-2-5/17

AUTHORS: Gromov, K. Ya., Dzhelepov, B. S., Dmitriyev, A. G.,
Preobrazhenskiy, B. K.

TITLE: On the Decay of $Nd^{140} \rightarrow Pr^{140} \rightarrow Ce^{140}$
(O raspade $Nd^{140} \rightarrow Pr^{140} \rightarrow Ce^{140}$)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1958,
Vol. 22, Nr 2, pp. 153 - 157 (USSR)

ABSTRACT: At first a survey on the data hitherto published is given and inconsistencies are pointed out. For this reason the investigations of the $Nd^{140} + Pr^{140}$ -radiation were repeated. The neodymium fraction was here chromatographically separated from a tantalum target irradiated with fast protons ($E_p = 660$ MeV). It was found that after 120 hours the preparation contains nothing but Nd^{140} . The electron radiation accompanying the decay of Nd^{140} and Pr^{140} was investigated by means of a magnetic β -spectrometer of the "ketron"-type. The positron-spectrum in the range of 0.4 ± 3 MeV and the electron-spectrum in the range of 12 ± 150 keV were investigated. The activity of the preparation was not high. On the basis of the

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On the Decay of $\text{Nd}^{140} \rightarrow \text{Pr}^{140} \rightarrow \text{Ce}^{140}$

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results in the investigation of the positron spectrum the Curie diagram was constructed. Above 750 keV the latter was linear. The limit energy of the positron spectrum is equal to 2470 keV. The Auger electron lines K-2L and K-LM were discovered in the electron spectrum. The half width of these groups of lines was 9 and 7 %. Other electron-lines were not observed. Under the same conditions as in the case of Nd^{140} the Tm - and Lu -isotopes were investigated here (Refs 11, 12). In some of the isotopes γ -transitions with about 80 keV were determined. The K-conversion lines of these transitions have an energy of about 20 keV. The K-line usually was widened by 1,5 - 2 %. The e/β^+ -value here obtained for Nd^{140} Pr^{140} (error not above 30 %) can either be used for the determination of the emission of the K-series of Auger-electrons or for the determination of the f^+/K_Σ values. There are 4 figures, 1 table, and 12 references, 2 of which are Soviet.

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1. Neodymium-Decay-Determination
2. Praseodymium-Decay-Determination
3. Cerium-Decay-Determination

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48-22-2-14/17

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TITLE:

Positron Spectra of the Dysprosium Fraction (Spektry pozitronov disproziyevoy fraktsii)

PERIODICAL:

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ABSTRACT:

The mentioned dysprosium fraction was here obtained by separation from the tantalum target, which was irradiated by protons with an energy of 660 MeV. In this connection it is stated, that no data can be found in publications on the dysprosium isotope with a half life of 20 hours. Dy¹⁵⁷ was ascribed to the eighth period (reference 2). From reference 3 it can be seen, that another Dy¹⁵⁵ exists with a half life of 10 hours. In order to determine which isotopes are contained in the here obtained preparation, its conversion spectrum was investigated, which resulted in the determination of 11 peaks of conversion electrons. 6 of these possessed the same half life of 11 ± 2 hours. The energy of the electrons amounted to 180 ± 10 , 270 ± 15 , 320 ± 20 , 400 ± 25 , 465 ± 30 and 610 ± 30 keV. It was assumed, that these are K-electrons, possessing

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Positron Spectra of the Dysprosium Fraction

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the transition energies 230, 320, 370, 450, 515, and 660 keV. Such transitions "apparently" correspond to Dy^{155} or Dy^{157} . The ratio of the number of positrons and of the number of conversion electron transitions with $h\nu = 515$ keV was established to be 37,5. A half life of 4,7 days and energies of 98, 112, 132 and 162 keV here corresponded to the four groups of conversion electrons. A comparison with the conversion spectrum of the dysprosium fraction as given in reference 3 permits to assume, that in this case it is concerned with the lines K-148, K-162, K-182 and K-210, which occur in the decay of Tb^{155} (the first three of them), which also pertains to the decay of Dy^{155} and Dy^{157} . Concerning the 20 hours decay period which was found in this investigation in the dysprosium fraction, it is stated here, that its origin remained unclear. Concerning this it is remarked, that in the measurements of the terbium fraction on a ketron (reference 4) positrons from a decay with a half life of 18 hours and a limit energy of ~ 2800 keV were observed, which is near to the found half life of ~ 20 hours. For this reason it is assumed, that the respective positron spectrum refers to the isotope Tb with a half life of 18 hours. There are 4 figures and 4 references, 3 of which are Soviet.

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Positron Spectra of the Dysprosium Fraction

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1. Dysprosium fraction-Positron spectra
2. Proton irradiation-Application

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